

RADIOECOLOGICAL AND GEOCHEMICAL SITUATION IN THE NORTH-WEST OF KOLA PENINSULA

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The scope of the paper is the current radioecological and geochemical situation in the north-west of Kola Peninsula. Study of ecological and geochemical environment in this area is an important task because of the high concentration of potential and existing sources of pollution here. The intensity of the environmental situation is caused mainly by the activity of radiation-dangerous objects. One of such enterprises is the ship reparation yard "Nerpa" specializing in the disposal of decommissioned nuclear submarines of the Russian Federation Navy since 1992. The purpose of the study is to analyze the anthropogenic impacts of nuclear industry on the landscapes of the northern territories on the example of the northwest Kola Peninsula. The area is located on the territory of the South-tundra acidic landscapes.

In accordance with the objective of the study the following tasks have been reviewed: 1) determination of ¹³⁷Cs contents in soil and lichen, 2) studying of the vertical profile of radiocaesium distribution in different types of soils, 3) estimation of the affect of the shipyard "Nerpa" industrial zone on the environment on the basis of the distribution of radionuclides in ecosystem components. Analysis of factors and conditions that control the accumulation of ¹³⁷Cs in soils exhibited that gley reduces their mobility and account for accumulation in soils, due to the presence of alkaline and reductive geochemical barrier. The acid-alkaline conditions have a significant influence on the behavior of radiocaesium: an increase in the acidity increases the mobility of ¹³⁷Cs in the soil profile. Peat soils with higher contents of organic matter are characterized by lower levels of ¹³⁷Cs in comparison with podzols and podburs soils, but they are more sensitive to contamination. The spatial trends provide such evidences. The cause of surface accumulative ¹³⁷Cs in the soils is the sorption and alkaline geochemical barriers. Maximum specific activity of ¹³⁷Cs depends on the thickness of the horizon and extends to different depths in different soil types. The lateral distribution of ¹³⁷Cs is moderate. It indicates by the small values of the coefficient of lateral differentiation ($L = 0.5-1.5$) in soils. Lateral differentiation of ¹³⁷Cs is more pronounced in organic horizons. It confirmed by contrast value of L - from 0.04 to 9.2. This distribution type of ¹³⁷Cs in the soil profile is more typical of subordinates ladscapes compared with autonomous ones. The difference of the L coefficient in the organic horizons and the average profile indicate that the soil of radial migration predominates over lateral one.